

CLAIMS

We claim:

1. A PNA probe comprising a nucleobase sequence suitable for the detection,
5 identification and/or quantitation of *Pseudomonas* (*sensu stricto*), said PNA
probe being complementary to a target sequence of 23S rRNA or rDNA of all
species of the genus *Pseudomonas*, or its complement.
2. The PNA probe of claim 1, wherein at least a portion of the probe is at least
10 about 90% identical to the nucleobase sequence or complement thereof
selected from the following sequence: CCT ACC ACC TTA AAC (Seq. Id. No.
1).
3. The PNA probe of claim 1-2, wherein the probe sequence is 8-17 subunits in
15 length.
4. The PNA probe of claim 1-3 for the detection, identification and/or
quantification of *Pseudomonas* (*sensu stricto*) comprising the following probe
sequence: CCT ACC ACC TTA AAC (Seq. Id. No. 1), the complement and/or
20 variations thereof.
5. The PNA probe of claim 1-4, wherein the probe is labeled with at least one
detectable moiety.
- 25 6. The PNA probe of claim 5, wherein the detectable moiety or moieties are
selected from the group consisting of: a conjugate, a branched detection
system, a chromophore, a fluorophore, a spin label, a radioisotope, an
enzyme, a hapten, an acridinium ester and a luminescent compound.
- 30 7. The PNA probe of claim 5-6, wherein the probe is self-reporting.

8. The PNA probe of claims 7, wherein the probe comprises a PNA Linear Beacon.

9. The PNA probe of claim 1-4, wherein the probe is unlabeled.

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10. The PNA probe of claim 1-9, wherein the probe is bound to a support.

11. The PNA probe of claims 1-10, wherein the probe further comprises a spacer or a linker.

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12. The PNA probe of claims 1-11, wherein in situ hybridization is used for analysis of *Pseudomonas* (*sensu stricto*) optionally present in the sample.

13. A method for the detection, identification and/or quantitation of *Pseudomonas* (*sensu stricto*) in a sample, said method comprising: a) contacting at least one of the PNA probes of claims 1-12 to the sample, b) hybridizing the PNA probe to a target sequence of species of the genus *Pseudomonas* in the sample; and c) detecting the hybridization as being indicative of presence, identity and/or amount of *Pseudomonas* (*sensu stricto*) in the sample.

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14. A method according to claim 13, wherein the analysis takes place in situ.

15. A method according to claim 12-13, wherein the analysis takes place by fluorescence in situ hybridization.

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16. A method according to claims 15, wherein the analysis does not involve the use of cross-linking reagents or enzymes prior to hybridization.

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17. The method of claim 12-14, wherein the method is used to detect a nucleic acid comprising a target sequence wherein said nucleic acid has been synthesized or amplified in a reaction.

5 18. The method of claim 17, wherein preferred nucleic acid synthesis or nucleic acid amplification reactions are selected from the group consisting of: Polymerase Chain Reaction (PCR), Ligase Chain Reaction (LCR), Strand Displacement Amplification (SDA), Transcription-Mediated Amplification (TMA), Rolling Circle Amplification (RCA) and Q beta replicase.

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19. The method of claim 12-18, wherein the method further comprises adding at least one blocking probe to reduce or eliminate any hybridization of the PNA probe to non-target sequence.

15 20. The method of claim 12-19, wherein the target sequence is immobilized to a surface.

21. The method of claim 12-20, wherein said PNA probe is immobilized to a surface.

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22. The method of claim 21, wherein said PNA probe is one component of an array.

23. The method of claims 12-22, wherein the sample is a biological sample.

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24. The method of claim 23, wherein the biological sample is blood, urine, secretion, sweat, sputum, stool, mucous, or cultures thereof.

25. A kit suitable for performing an assay for detection, identification and/or quantitation of *Pseudomonas* (*sensu stricto*) in a sample, wherein said kit comprises: a) a PNA probe according to claim 1 to 12 and b) other reagents

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or compositions necessary to perform the assay.

26. The kit of claim 25, wherein *Pseudomonas* (sensu stricto) and at least one other microorganism optionally present in a sample are independently detected, identified and/or quantitated.

27. The kit of claim 25-26, wherein *Pseudomonas* (sensu stricto) optionally present in a sample is detected, identified and/or quantitated and its susceptibility to antimicrobial agents is determined.

28. The kit of claim 25-27, wherein the kit is used in an in-situ hybridization assay.

29. The kit of claim 22-27, wherein the kit is used for a real-time PCR assay.

30. The kit of claim 22-29, wherein the kit is used to examine clinical samples such as clinical specimens or cultures thereof.

31. The kit of claim 25-29, wherein the kit is used to examine food, beverages, water, pharmaceutical products, personal care products, dairy products or environmental samples or cultures thereof.

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